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CASE REPORT

Rupture of pseudocyst of the spleen during cardiopulmonary resuscitation

Amit Sinha*, **Sayed A.W. Ahmed**, **Javeed Khan**

Russells Hall Hospital, Pensnett Road, Dudley, West Midlands DY1 2HQ, United Kingdom

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Introduction

Pseudocysts of the spleen are mostly traumatic in origin and due to the nature of its aetiology it mainly occurs in young and middle aged adults. Despite a concern about the possibility of its rupture, there are not many cases reported in literature.

We describe a case of a 50-year-old man with ischaemic heart disease who presented with severe angina to the emergency department and had a cardiac arrest. A successful cardiopulmonary resuscitation was complicated by rupture of a pseudocyst of his spleen.

This report discusses the concept of splenic pseudocyst, which has particular relevance in view of the increasing trend towards conservative management of splenic injuries in haemodynamically stable patients.

Case report

A 50-year-old heavy smoker was admitted to the ward with persistent anginal chest pain and high blood pressure (241/110 mmHg). He was known to have hypertension, ischaemic heart disease with previous myocardial infarction and was poorly compliant with his routine medications. Electrocardiogram showed a posterior myocardial infarction and his blood results showed a raised troponin level.

He had a previous history of having been admitted to hospital with blunt trauma to the left upper quadrant 7 months previously and an ultrasound scan at that time was reported as normal. He had persistently complained of left-sided upper abdominal discomfort for which he was having symptomatic treatment.

Soon after admission he had a cardiac arrest but was revived after cardiopulmonary resuscitation (CPR). He was transferred to the Coronary Care Unit with anti-anginal medications. Two hours later the patient had a further arrest. He was noted to be hypotensive (78/51 mmHg) and tachycardic (122 min^{-1}) and underwent CPR again. During resuscitation his blood gases showed his haemoglobin to be 6.9 g/dl compared to 13.4 g/dl on admission. An emergency CT scan showed a large quantity of free fluid in the abdomen and left pleural cavity. There was evidence of haemorrhage in the left upper quadrant of the abdomen tracking through the diaphragmatic hiatus into the posterior mediastinum and the left pleural cavity (Figs. 1 and 2). An 11 cm cyst in relation to the spleen was noted (Fig. 2).

Following resuscitation, the patient underwent emergency laparotomy at which free blood was noted in the peritoneal cavity and an abnormal looking spleen was removed. As haemostasis was

* Corresponding author. Tel.: +44 1384 345059.
E-mail address: kushyash@hotmail.com (A. Sinha).

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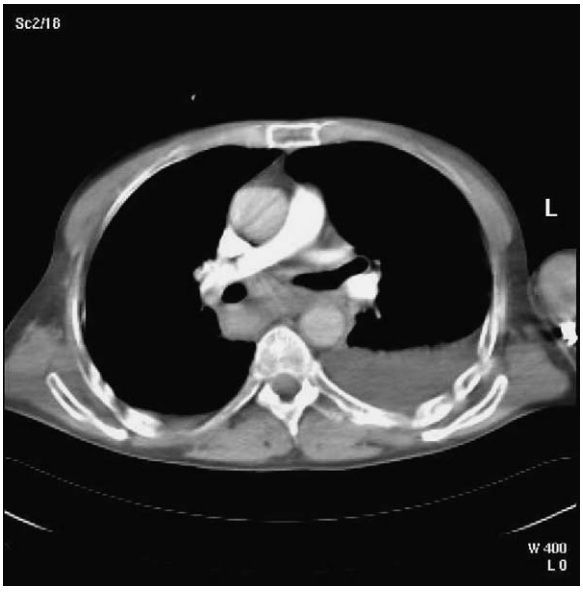

Figure 1 Free fluid in the left pleural cavity. This was thought to be tracking through the diaphragmatic hiatus into the posterior mediastinum and into the left pleural cavity.

found to be satisfactory at the end a mass adjacent to the spleen was not disturbed because of a risk of causing further bleeding. During the post-operative period he remained stable, made a good recovery and was discharged home 10 days later.

Histopathology of his removed spleen showed it to be of average dimension with evidence of a partially encysted subcapsular haematoma. No other chronic abnormality was noted.

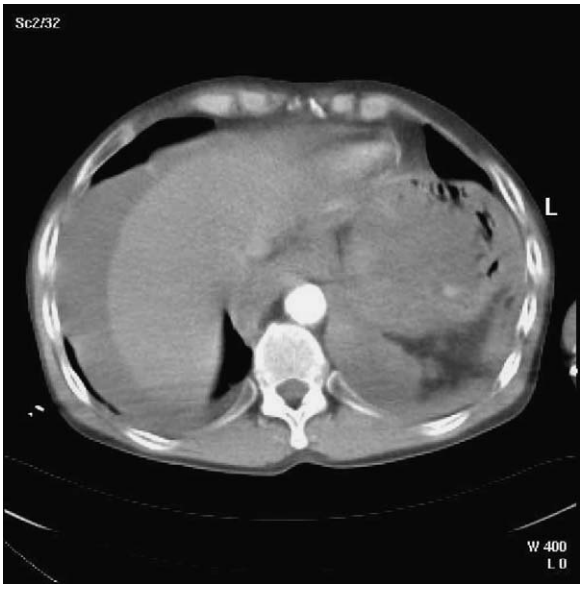

Figure 2 Free fluid in the peritoneal cavity associated with a large (11 cm) pseudocyst of the spleen.

Discussion

Cysts of the spleen as classified by Martin in 1958[9] can have a cellular lining and are known as primary or true cysts or may be devoid of a cellular lining when they are known as secondary or pseudocysts. True cysts are either parasitic (hydatid) congenital or neoplastic. The majority of pseudocysts result from trauma and represent resolution of a subcapsular or intraparenchymal haematoma. Other causes of splenic pseudocysts described in the literature are intrasplenic pancreatic pseudocysts, spontaneous subcapsular splenic haematomas associated with infectious mononucleosis or cytomegalovirus infection and haematomas of the spleen as a complication of colonoscopy. Post-traumatic cysts account for 75% of all non-parasitic splenic cysts[1] although 30% of patients do not recall any trauma.[3]

Cysts can cause non-specific upper abdominal symptoms as in our patient but many patients may remain asymptomatic and cysts can remain in situ for several years prior to becoming symptomatic. Their increasing recognition, as a result of frequent use of CT scans for non-specific abdominal symptoms combined with a trend towards conservative management of splenic trauma has raised concerns about their appropriate management. In our patient there was CT scan evidence of a pseudocyst of the spleen, which presumably developed as a result of blunt trauma 7 months previously.

Splenic cysts can be characterised by imaging and its association with surrounding structures defined. When the cyst is considered to be benign an ultrasound guided percutaneous aspiration helps in establishing the diagnosis. Preoperatively it is important to exclude the presence of Echinococcus to avoid spread as well as anaphylactic shock.[6,19]

Once a pseudocyst of the spleen is confirmed the main concern is the risk of its rupture. There are only sporadic reports in literature describing rupture[3,10] but the consequences of such an event can be catastrophic. The development of a pseudocyst of the spleen has to be considered in conjunction with delayed rupture of the spleen, which occurs in approximately 1% of blunt force injuries to the spleen[11] but mortality from delayed rupture is said to be 5—15% compared to 1% in cases of acute splenic injury.[7]

Due to the rarity of the condition there is no general consensus with regard to its management. There are suggestions, however, that symptomatic cysts and asymptomatic cysts larger than 5 cm should have some form of intervention.[5,12,16] Cysts smaller than 5 cm often resolve.[16,18] Patients with haematomas around the spleen, if treated

conservatively, are recommended to have follow-up scans until the haematoma has fully resolved.[13,17]

When surgical intervention is thought to be necessary in cases of pseudocysts of the spleen, laparoscopic marsupialisation appears to be effective in most cases,[4,14] the other options being partial or total splenectomy should it be necessary.[5,15]

In our patient it appears that rupture of his splenic pseudocyst was precipitated by the initial attempt at cardiopulmonary resuscitation. Effective cardiopulmonary resuscitation requires an efficient external cardiac message for any beneficial outcome and its association with visceral injuries is well-known.[2,8] Krischer et al. looked at a series of 705 patients that had an autopsy to identify the cause of death following CPR. They described splenic laceration in 0.3% of cases. The chances of this occurring are exaggerated in those harbouring an associated abnormality with regard to their spleen as is apparent in the reported case.

Conclusion

Splenic pseudocysts can be the source of major life-threatening haemorrhage if exposed to further trauma. Their early recognition and elective management may help avoid splenectomy, which can become necessary in an emergency situation.

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